

**Claims****WHAT IS CLAIMED IS:**

1. A structural roof panel comprising
  - an upper membrane having a generally rectangular shape;
  - a lower membrane having a similar shape as, and being positioned below and generally parallel to, said upper membrane ;
  - an intermediate section between said upper and lower membranes; and
  - an outer membrane fixed to the upper surface of said upper membrane.
2. A panel according to claim 1, wherein  
said outer membrane comprises polyisobutylene.
3. A panel according to claim 1, wherein
  - said upper and lower membranes comprise steel sheets; and
  - said intermediate section comprises polyurethane foam.
4. A panel according to claim 1, further comprising
  - a first male tongue and a first female groove running along and generally parallel to a first sidewall of said panel; and
  - a second male tongue and a second female groove running along and generally parallel to a second sidewall of said panel, said second sidewall being opposite to and generally parallel to said first sidewall; and
  - said first and second tongues and grooves being adapted to lockingly engage, respectively, with corresponding tongues and grooves on similar panels placed adjacently to said roof panel.
5. A panel according to claim 4, further comprising
  - a first and second steel lining member associated with and lining each of said first and second female grooves, respectively.
6. A panel according to claim 4, wherein  
said first and second sidewalls are angularly offset with respect to said upper membrane by a first angle.
7. A panel according to claim 6, wherein  
said first angle is in the range of approximately 0 degrees to 45 degrees.
8. A panel according to claim 6, wherein  
said first angle is approximately 45 degrees.

9. A panel according to claim 4, wherein  
said first male tongue is positioned above said first female groove, and said second female groove is positioned above said second male tongue.
10. A panel according to claim 4, wherein  
said outer membrane comprises polyisobutylene.
11. A panel according to claim 4, further comprising  
attaching means for attaching said panel to a structure upon which said panel is positioned, said attaching means comprising a screw hole in said panel extending from said lower membrane and into said intermediate section and being adapted to receive a screw therein.
12. A panel according to claim 1, wherein  
said outer membrane extends beyond at least one edge of said upper membrane so as to form a lap section for overlapping a joint between said roof panel and an adjacently placed, like panel.
13. A panel according to claim 12, further comprising  
adhesive fixed to the underside of said lap section for adhering to said adjacently placed, like panel; and  
a peel-away sheet covering said adhesive and being selectively removable to expose said adhesive.
14. A roofing system for assembling a roof directly upon a series of generally parallel, laterally-spaced elongated structural support members, said system comprising  
a series of generally rectangular panels each adapted to span at least the length of the distance between a successive pair of said structural support members;  
each said panel comprising a first male tongue and a first female groove on one sidewall, and a second male tongue and a second female groove on an opposite sidewall, thereby adapting each panel to be adjacently positioned and interlocked with another panel by mating of said first and second male tongues with said first and second female grooves; and  
each said panel comprising a membrane of polyisobutylene fixed to the top surface of each panel.
15. A roofing system according to claim 14, wherein  
each said panel further comprises a lap portion of said polyisobutylene membrane that extends beyond at least one side of said panel, said lap portion being adapted to overlap a joint between an adjacently placed panels.

16. A roofing system according to claim 15, wherein  
said lap portion is provided with adhesive fixed to the underside of said lap portion for adhering to said adjacently placed panels.
17. A roofing system according to claim 16, further comprising  
a peel-away sheet covering said adhesive and being selectively removable to expose said adhesive.
18. A roofing system according to claim 14, wherein  
each panel comprises an upper and lower steel membrane, each being generally parallel to the other; and  
an intermediate portion between said upper and lower steel membranes.
19. A roofing system according to claim 18, wherein  
said one sidewall and said opposite sidewall are each angularly offset with respect to said upper membrane at an angle in the range of about 0 degrees to 45 degrees.
20. A roofing system according to claim 18, wherein  
said one sidewall and said opposite sidewall are each angularly offset with respect to said upper membrane at an angle of about 45 degrees.
21. A roofing system according to claim 14, wherein  
each panel comprises attaching means for attaching said panel to said structural support members, said attaching means comprising a screw hole in said panel extending from said lower membrane and into said intermediate section and being adapted to receive a screw therein.
22. A method of making a structural roof panel, said method comprising  
providing an upper membrane ;  
providing a lower membrane ;  
providing an intermediate layer between said upper and lower membranes ;  
and  
adhering to said upper membrane an outer membrane of polyisobutylene.

23. A method according to claim 22, wherein
- said upper and lower membranes are provided on rolls which are controllably unrolled generally simultaneously, while said upper and lower membranes are maintained in spaced apart, generally parallel relationship;
  - said outer membrane is provided on a roll which is positioned above said upper membrane and controllably unrolled;
  - an adhesive is applied between said upper membrane and said outer membrane; and
  - a pressure roller biases said outer membrane against said upper membrane to facilitate adhesion therebetween.
24. A method according to claim 23, wherein
- prior to the step of applying adhesive, a first cutter cuts off said upper and lower membranes, and said intermediate layer, thereby forming a generally rectangular panel ; and
  - subsequent to biasing said outer membrane against said upper membrane, a second cutter cuts off said outer membrane at a desired length relative to said panel.
25. A method according to claim 24, wherein
- said desired length to which said outer membrane is cut is longer than the length of said panel.
26. A method according to claim 22, wherein
- said panel includes opposed sidewalls extending between said upper membrane and said lower membrane, each sidewall being formed with a male tongue and a female groove adapted to mate in interlocking fashion with like tongues and grooves on adjacently-placed, like panels.
27. A method according to claim 22, wherein
- said method is a single, continuous process.
28. A method of assembling a roof structure, said method comprising
- providing a plurality of roof panels each having a pre-applied, weather-resistant outer layer;
  - placing said roof panels adjacently with respect to each other; and
  - structurally attaching said panels to each other.
29. A method according to claim 28, further comprising
- overlapping at least a portion of one of said panels with respect to an adjacently placed panel thereby forming a weatherproof, water-tight sealed joint.

30. A method according to claim 28, wherein  
said outer layer comprises a membrane of polyisobutylene.
31. A method according to claim 29, wherein  
an adhesive is pre-applied to the underside of said portion.